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## Summary report: Evaluation of the benthic trawl as a means to sample juvenile and adult pallid sturgeon from main channel habitats of the Missouri River

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- **TITLE:** Summary report: Evaluation of the benthic trawl as a means to sample juvenile and adult pallid sturgeon from main channel habitats of the Missouri River.

**PRINCIPAL INVESTIGATOR:**

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**STUDY AREA:**

The Missouri River forming the border between Nebraska and South Dakota, Iowa, and Missouri. The upper unchannelized reach extends from the Nebraska-South Dakota state line (river kilometer (rkm) 1,411) to the upper end of Lewis and Clark Lake (rkm 1,347). The lower unchannelized reach extends from Gavins Point Dam (rkm 1,308) to the mouth of the Big Sioux River (rkm 1,184). The upper channelized reach extends from the mouth of the Big Sioux River (rkm 1,184) to the mouth of the Platte River (rkm 959). The lower channelized reach extends from the mouth of the Platte River (rkm 959) to the Nebraska-Kansas state line (rkm 802).

**RESEARCH OBJECTIVES:**

The objectives of this study are to:

- 1 Conduct a systematic, quantitative benthic trawl survey of main channel habitats of the Missouri River bordering Nebraska.
- 2 Document seasonal distribution and abundance by habitat type of pallid sturgeon, shovelnose sturgeon and associated species such as sturgeon chub, sicklefin chub and flathead chub.
- 3 Evaluate trawl design and trawling methodology.
- 4 Establish a baseline that can be used to measure the effects of restoration efforts on pallid sturgeon distribution and abundance.

**2001 ACTIVITIES:**

The project was funded in June. Personnel were hired and field work started in late June. Design and specifications on the trawl boat was completed by August. A request for bids followed, and the boat was ordered from Clark Boats of Bellevue, Iowa in early September. The boat is nearing completion and should be available prior to the beginning of the 2002 sampling season. Because the new trawl boat was not completed and the our existing river trawl boat was being used extensively for the mitigation site monitoring project, we were not able to develop a sampling schedule that equitably divided our sampling effort amongst all sections of the river. Many weeks the trawl boat was only available for a day, allowing only trips to the nearby channelized reaches of the river. Because of the limited availability of the trawl boat, we expanded our sampling effort to include experimental mesh gill nets and once they were built the recently adopted "Standard Missouri River Sturgeon Gill Net".

A total of 241 trawl samples were made from 11 different reaches of the Missouri River during 2001 (Table 1). Catch rates were similar for the total number of fish and for shovelnose sturgeon in both the summer (June through August) and fall (September through November). Thirty nine shovelnose, one pallid sturgeon and possibly one hybrid shovelnose/pallid sturgeon were collected. The pallid sturgeon was collected near the delta of the Niobrara River on 8 August 2001 and was a recaptured hatchery raised fish (pit tag number 411B496358). A possible shovelnose/pallid sturgeon hybrid was collected from the main channel just below the mouth of the Platter River on 13 August 2001.

A total of 223 shovelnose sturgeon were sampled using gill nets from the upper unchannelized and lower

channelized Missouri River during 2001 (Table 2). Catch rates ranged from 0 to 22.3 sturgeon per net night.

Shovelnose sturgeon are being tagged with pit tags, pectoral spines are being removed from a sub-sample of shovelnose sturgeon for age analysis and we are evaluating a methodology using photographs to collect meristics and fin ray counts for use in species indices.

Table 1. Effort (number of trawls), total number of fish, shovelnose and pallid sturgeon collected and catch per trawl of all fish, shovelnose and pallid sturgeon using the benthic sturgeon trawl by season from the Missouri River, Nebraska during 2001.

| Reach / Site        | Effort        |                      | Total Fish    |                      | Shovelnose sturgeon |                      | Pallid sturgeon |                      |
|---------------------|---------------|----------------------|---------------|----------------------|---------------------|----------------------|-----------------|----------------------|
|                     | June - August | September - November | June - August | September - November | June - August       | September - November | June - August   | September - November |
| Upper unchannelized |               |                      |               |                      |                     |                      |                 |                      |
| Lower Boyd County   | 3             | 5                    | 0             | 0                    | 0                   | 0                    | 0               | 0                    |
| Verdel              | 12            | 27                   | 3             | 5                    | 0                   | 0                    | 0               | 0                    |
| Ponca Creek         | 9             | 17                   | 10            | 4                    | 0                   | 0                    | 0               | 0                    |
| Niobrara            | 3             | 11                   | 2             | 0                    | 1                   | 0                    | 1               | 0                    |
| Lower Unchannelized |               |                      |               |                      |                     |                      |                 |                      |
| St. Helena          | 18            |                      | 13            |                      | 3                   |                      | 0               |                      |
| Upper Channelized   |               |                      |               |                      |                     |                      |                 |                      |
| Bellevue            | 15            | 19                   | 4             | 35                   | 0                   | 12                   | 0               | 0                    |
| Lower Channelized   |               |                      |               |                      |                     |                      |                 |                      |
| Tobacco Island      | 9             |                      | 5             |                      | 4                   |                      | 0               |                      |
| Goose Island        |               | 12                   |               | 3                    |                     | 2                    |                 | 0                    |
| Nebraska City       | 27            |                      | 9             |                      | 6                   |                      | 0               |                      |
| Hamburg Bend        | 28            | 6                    | 12            | 0                    | 8                   | 3                    | 0               | 0                    |
| Peru                |               | 20                   |               | 14                   |                     | 0                    |                 | 0                    |
| Total               | 124           | 117                  | 58            | 61                   | 22                  | 17                   | 1               | 0                    |
| Catch per trawl     |               |                      | 0.47          | 0.52                 | 0.18                | 0.15                 | 0.01            | 0.0                  |

Table 2. Effort (number of overnight gill net sets), total number of shovelnose and pallid sturgeon collected and catch per net night of shovelnose sturgeon using gill nets from the Missouri River, Nebraska from September through November, 2001.

| Reach / Site   | Effort | Shovelnose<br>sturgeon | Pallid<br>Sturgeon | Shovelnose<br>per net night |
|--|--------|------------------------|--------------------|-----------------------------|
| September - November                                   |        |                        |                    |                             |
| Assorted Experimental Gill Nets                        |        |                        |                    |                             |
| Upper unchannelized                                    |        |                        |                    |                             |
| Lower Boyd County                                      | 2      | 1                      | 0                  | 0.5                         |
| Verdel   | 5      | 10                     | 0                  | 2.0                         |
| Niobrara   | 6      | 0                      | 0                  | 0.0                         |
| Lower Channelized                                      |        |                        |                    |                             |
| Plattsmouth  | 11     | 92                     | 0                  | 8.4                         |
| Total  | 24     | 103                    | 0                  | 4.3                         |
| Standard Missouri River Sturgeon Experimental Gill Net |        |                        |                    |                             |
| Lower Channelized                                      |        |                        |                    |                             |
| Plattsmouth  | 5      | 51                     | 0                  | 10.2                        |
| Brownville   | 6      | 134                    | 0                  | 22.3                        |
| Indian Cave  | 5      | 38                     | 0                  | 7.6                         |
| Total  | 16     | 223                    | 0                  | 13.9                        |